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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,788	09/26/2001	Setsuo Kobayashi	1113.40340X00	8825

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EXAMINER

RUDE, TIMOTHY L

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/889,788

Applicant(s)

KOBAYASHI ET AL.

Examiner

Timothy L Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims

1. Claims 1, 7, and 14 are amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

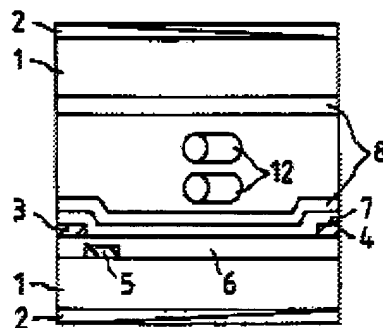
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 7-9, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe et al (Ohe '464) USPAT 5,600,464 in view of Ota et al (Ota) USPAT 5,831,707.

As to claims 1, 7, 9, and 14-15, Ohe '464 discloses in Figures 1-6, a liquid crystal display device comprising a pair of substrates and a liquid crystal layer held between the pair of substrates (Summary of the Invention, col. 1, line 45 through col. 3, line 63), at least one of the pair of substrates being provided with plural electrodes, 3 & 4, for applying a lateral electric field to the liquid crystal layer (col. 1, lines 56 and 57); an insulating film, 7 (Applicant's protection films), wherein the film thickness of the protecting film is in the range of 0.4 μm to 2 μm (col. 3, lines 32-35), and oriented films,

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8, free from side chain structure (see chemical formula, col. 9, lines 22-24, and Ohe does *not* teach the use of side chain type structure; Ohe is evidence that alignment films free from side chain structure were in common use at the time the claimed invention was made), formed on both of the pair of substrates (col. 1, lines 58-62); wherein "residual image is substantially eliminated" (col. 1, lines 46-50) to the point where "no visible residual image was observed at all" (col. 9, lines 40-45) (Applicant's an AC residual image of the oriented films is less than 8%).

FIG. 1(a)

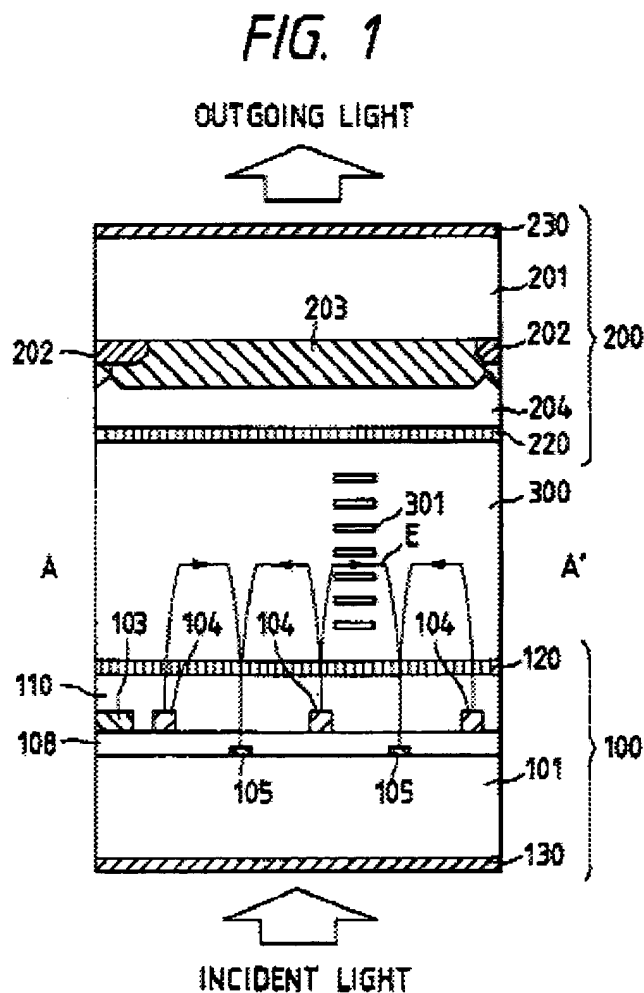
The invention of Ohe '464 deals primarily with the improved insulating and alignment layers to reduce residual image, and the values of Ohe '464 overlap the claimed ranges.

Ohe '464 does not explicitly disclose that the residual image which is substantially eliminated (Applicant's less than 8%) occurs even in a case of driving by pure AC.

Ota teaches that in an in-plane switch LCD the use of AC driving (Applicant's driving by pure AC) reduces the residual image relative direct current operation (col. 9, lines 54-65) to achieve a display having preferable quality. Note that Ota confirms the

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AC residual image would be less than the unspecified (AC or DC) residual image that has already been made virtually zero by Ohe '464, therefore the combination meets Applicant's claimed range of less than 8%.



Ota is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add driving by pure AC to achieve a display having preferable quality.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 with the driving by pure AC of Ota to achieve a display having preferable quality.

As to claims 2, 8, and 16, Ohe '464 discloses (col. 2, lines 60-63) the use of a specific resistance of the liquid crystal layer of 1×10^9 to $8 \times 10^{15} \Omega \cdot \text{cm}$ (overlaps Applicant's $10^{10} \Omega \cdot \text{cm}$ or more, establishes *prima facie* obviousness). Optimization of a results effective variable requires only ordinary skill in the art.

3. Claims 3, 10, and 17, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe '464 in view of Ota, as applied to claims above, and further in view of Mishina et al (Mishina) USPAT 5,350,539.

As to claims 3, 10, and 17, Ohe '464 in view of Ota discloses the liquid crystal display device according to claims 1, 7, and 15.

Ohe '464 in view of Ota does not explicitly disclose a device wherein at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount.

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Mishina teaches the use of at least 10 mol % (overlaps Applicant's 5% and at most 30%) of an alkyl group (col. 2, line 44 through col. 3, line 23) to provide low temperature heat treatment and stable alignment properties (col. 1, lines 5-9). Mishina also teaches that the alkyl group may be a long-chain alkyl group in order to raise the tilt angle (col. 5, lines 23-25).

Mishina is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add 5% ~ 30% long-chain alkyl group to raise the tilt angle while providing low temperature heat treatment and stable alignment properties.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 in view of Ota with the add 5% ~ 30% long-chain alkyl group of Mishina to raise the tilt angle while providing low temperature heat treatment and stable alignment properties.

4. Claims 4, 5, 6, 11-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe '464 and Ota in view of Mishina as applied to claim 3 above, and further in view of Yu et al (Yu) USPAT 6,066,696.

As to claims 4, 5, 6, 11-13, and 18-20, Ohe '464 and Ota in view of Mishina disclose the liquid crystal display device according to claims 1, 3, 7, 10, 15, and 17.

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Ohe '464 and Ota in view of Mishina do not explicitly disclose a device, wherein a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000.

Yu teaches the use of 1% to 20% (by weight, col. 5, lines 14-21) of a polyimide having an alkyl group at both ends (Applicant's terminal type) (col. 2, lines 32-60) with a molecular weight of 5×10^3 to 5×10^5 (col. 5, lines 21-28) (overlaps Applicant's 2,000 and at most 30,000) for improved optical alignment and thermal stability (col. 5, lines 19-21).

Yu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a polyimide having an alkyl group with a molecular weight of 2,000 and at most 30,000 for improved optical alignment and thermal stability.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 and Ota in view of Mishina with a polyimide having an alkyl group with a molecular weight of 2,000 and at most 30,000 of Yu for improved optical alignment and thermal stability.

Response to Arguments

5. Applicant's arguments filed on 19 November 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Regarding claims 1-1, 7-9, and 14-16, the claimed features are not disclosed or suggested anywhere by any combination of the references of record.

(2) Prior art does not disclose an orientation film free from side chain type structure.

(3) Independent claims 1, 7, and 14 claim a residual image of less than 8% in the case where the driving voltage is pure AC which is not disclosed by the prior art.

(4) A DC residual image is not related to the claimed application of pure AC.

(5) Regarding claims 2, 8, and 16, the claimed specific resistance of the liquid crystal layer is not described or suggested by Ohe or Ota, even in combination with other references.

(6) Regarding claims 3, 10, and 17, Ohe or Ota even in combination with other references do not disclose the claimed "at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount."

(7) Regarding claims 4, 11, and 18, Ohe or Ota even in combination with other references do not disclose the claimed alignment film that is an organic polymer with “a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000.”

(8) Regarding claims 5-6, 12-13, and 19-20, Ohe or Ota even in combination with other references do not disclose the claimed polymer of a “long-chain alkylene group of at least one of a main chain type and a terminal type.”

(9) If anything, Ota teaches away from Applicant’s discovery of the phenomenon that residual image can be generated even in “pure AC”.

(10) Examiner has improperly used Applicant’s disclosure as an instruction book on how to reconstruct to the prior art to arrive at Applicant’s claimed invention, and interview(s) are requested.

Examiner’s responses to Applicant’s ONLY arguments are as follows:

(1) Regarding claims 1-1, 7-9, and 14-16, It is respectfully pointed out that the claimed features are disclosed and/or suggested by the combinations of the references applied in the rejections above.

(2) It is respectfully pointed out that Ohe teaches the use of a specific material that is free from side chain type structure per rejections above.

(3) It is respectfully pointed out that the unspecified (AC or DC) residual image of Ohe '464 is "substantially eliminated" to be "no residual image at all" per rejections above, and that the AC residual image is less than the DC residual image as a matter of physics as is evidenced by Ota, per rejections above. Therefore, the DC residual image of the device of Ohe '464 is a more stringent constraint on reducing the residual image than is Applicant's claimed AC residual image. Consequently, Ohe '464 meets the claimed limitations of a residual image of less than 8% in the case where the driving voltage is pure AC as is evidenced by Ota.

(4) It is respectfully pointed out that Ota teaches that the DC residual image is related to the claimed application of pure AC, in that the DC residual image is larger, per rejections above.

(5) Regarding claims 2, 8, and 16, the claimed specific resistance of the liquid crystal layer is disclosed by Ohe '464, per rejections above.

(6) Regarding claims 3, 10, and 17, it is respectfully pointed out that Mishina is applied to teach "at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount", per rejections above.

(7) Regarding claims 4, 11, and 18, it is respectfully pointed out that Yu is applied to teach "a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000" for improved optical alignment and thermal stability,

per rejections above. Please note that Applicant merely claims that the orientation film merely contains such, as opposed to consisting of such.

(8) Regarding claims 5, 12, and 19, it is respectfully pointed out that Yu is applied to teach the use of 1% to 20% (by weight, col. 5, lines 14-21) of a polyimide having an alkyl group at both ends (Applicant's terminal type) (col. 2, lines 32-60) with a molecular weight of 5×10^3 to 5×10^5 (col. 5, lines 21-28) (overlaps Applicant's 2,000 and at most 30,000) for improved optical alignment and thermal stability (col. 5, lines 19-21), per rejections above.

(9) It is respectfully pointed out that Ota teaches residual image is reduced by driving with AC vs DC. This does not teach away from Applicant's discovery of the phenomenon that some residual image can still remain even when driving with "pure AC". Furthermore, residual image is not a goal. Minimization or preferably elimination of residual image is the goal. Discovery of something undesirable, and how to create something undesirable, is generally not of value. Prior art teaches a device wherein "residual image is substantially eliminated" (col. 1, lines 46-50) to the point where "no visible residual image was observed at all" (col. 9, lines 40-45) which meets Applicant's claimed range of less than 8%, per rejections above.

(10) It is respectfully pointed out that all combinations are made with proper motivations without any improper hindsight, and examiner has supported requested interview(s) and will continue to support interview(s) as justified by Applicant. Please note that all rejections are directed to the present form of the claims as broadly interpreted. Arguments as to potential allowable subject matter that does not appear in

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the claims are not relevant to the rejections above, but might help to prepare amendments to said claims. Examiner does not presently have knowledge of any allowable subject matter in the instant Application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude
Examiner
Art Unit 2871



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER